

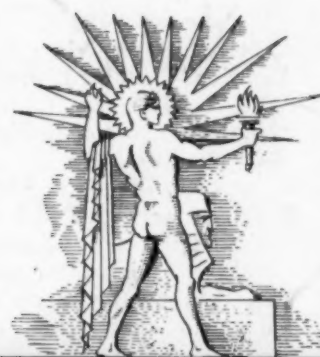
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SCIENCE NEWS LETTER

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THE WEEKLY SUMMARY OF CURRENT SCIENCE •



December 13, 1941

Entrance to Science Service

See Page 375

A SCIENCE SERVICE PUBLICATION

Do You Know?

The United States *fruit crop* is estimated at about 3% more than last year—slightly less citrus fruit, more of some other types.

The same dull olive drab, *non-reflecting paint* used to coat Army tanks and trucks has been sprayed on 2,000,000 steel Army helmets.

A hatchery reports that the fastest growth for fingerling *trout* up to six inches is made by brook trout, followed by rainbow, brown, and lake.

British officials state: "Two in every nine boys in Britain between the ages of 16 and 18 are in training to become the *R.A.F.* of the future."

Refrigerated chests are used in airplane construction to keep "fresh" a special aluminum alloy rivet that is hard and unworkable when warm.

Few wild animals are shipped from distant lands these days, and *zoos* are said to be doing a great deal of swapping and selling with one another.

Every summer since 1935, General Electric's "lightning laboratory" has sent a research engineer to New York to photograph *lightning* striking the Empire State Building.

From experiments with *lizards*, a scientist infers that reptiles require hotter weather to bring them out of hibernation than the temperature that drives them into burrows in autumn.

QUESTIONS DISCUSSED IN THIS ISSUE

Most articles which appear in SCIENCE NEWS LETTER are based on communications to Science Service, or on papers before meetings. Where published sources are used they are referred to in the article.

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PSYCHOLOGY-SOCIOLOGY

Does public war fever serve to start major wars? p. 375.

PUBLIC HEALTH

How will insulin standards be protected after the patents expire? p. 375.

Canada's *jackfish* sometimes eat live ducklings.

Like children *sucking a thumb*, infant baboons suck a thumb or toe.

There are 25 miles of passageways in old *salt mines* under the city of Detroit.

As a substitute for wool in blankets, France is experimenting with fiber from *Spanish broom*.

Headquarters for the sense of *smell* is an area the size of a penny at each side of the nose.

An ancient *skeleton* found in California is believed to be evidence for the theory that seals and sea lions had a common ancestor.

The *elf owl* of North America is only about six inches long.

Watermelons are tempting bait for raccoons, Oklahoma experiments show.

The War Department's Morale Branch plans to test soldiers' *music* preferences at experimental concerts.

Argentina plans to expand *weather services* to include 320 observation and reporting stations to aid its fliers.

Many kinds of *steel* used in this war's planes, tanks, and ships were not available during the first World War.

The U. S. Army is trying out reddish-colored *tomato bread*, using powdered milk and tomato juice or canned tomatoes added to the dough.

SCIENCE NEWS LETTER

Vol. 40 DECEMBER 13, 1941 No. 24

The Weekly Summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc., 1719 N St., N. W., Washington, D. C. Edited by WATSON DAVIS.

Subscriptions—\$5.00 a year; two years, \$7.00; 15 cents a copy. Ten or more copies to same address, 5 cents a copy. Back numbers more than six months old, 25 cents.

In requesting change of address, please give your old address as well as the new one, at least two weeks before change is to become effective.

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Cable address: Scienserve, Washington.

Entered as second class matter at the post-office at Washington, D. C., under the Act of March 3, 1879. Established in mimeographed

form March 18, 1922. Title registered as trademark, U. S. and Canadian Patent Offices. Indexed in Readers' Guide to Periodical Literature, Abridged Guide, and in the Engineering Index.

The Science Observer, established by the American Institute of the City of New York, is now included in the SCIENCE NEWS LETTER.

Members of the American Association for the Advancement of Science have privilege of subscribing to SCIENCE NEWS LETTER, at \$3 a year.

The New York Museum of Science and Industry has elected SCIENCE NEWS LETTER as its official publication to be received by its members.

Advertising rates on application. Member Audit Bureau of Circulation.

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MEDICINE

New Infantile Paralysis Treatment Gets Approval

Sister Kenny Method Using Hot Packs To Relieve Spasm With Early Attempts at Motion Confirmed in Trials

INFANTILE paralysis patients in the future may recover with a shorter period of pain and with less crippling and deformity as a result of a revolutionary change in treatment which was approved by the National Foundation for Infantile Paralysis at its second annual medical meeting in New York.

The new treatment, known as the Sister Kenny method, was developed by Miss Elizabeth Kenny, whose nursing title in Australia is "Sister." Instead of using splints and casts to keep muscles at complete rest, with the idea of thus preventing further deformity, Sister Kenny uses hot packs to relieve painful muscle spasm, and as soon as this is accomplished, she starts teaching the patients to think of and gradually to achieve motion in the affected muscles.

Satisfactory results with this treatment at the University of Minnesota Medical School were reported to the Foundation, which sponsored this trial of the Sister Kenny method.

Support for abandonment of immobilization in treatment of infantile paralysis appeared also in studies reported by several of the scientists whose work the Foundation has supported.

Shortening and distortion of limbs, contrary to previous opinion, are not caused by the pull of unbalanced powerful muscles on paralyzed ones. Rather they are caused by contraction of a severely paralyzed group of muscles which has been allowed to remain in one position for any length of time, Dr. Arthur Steindler, of the State University of Iowa, reported.

Frequent motion and use of muscles, within the limits of fatigue and without splinting, have given as good results, in patients treated so far, as any other method, he reported, although the number of patients is small compared with the number treated by immobilization.

Keeping a leg motionless produces the same kind of changes in the muscles of that leg as does removal of the nerves controlling the muscles, Dr. Donald Young Solandt, of the University of Toronto, discovered in animal studies.

Restricting the activity of infantile paralysis patients may delay recovery, it appears from findings in animals reported by Dr. Harry M. Hines and associates at the State University of Iowa.

In the animals, restriction of activity failed to enhance recovery of paralyzed muscle and Dr. Hines found some evidence that it might be delaying recovery.

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Muscles Flash Light

SIGNALS flashed in a bulb by the electrical energy of transplanted muscles are helping infantile paralysis victims learn to walk, Dr. Dallas B. Phemister, of the University of Chicago, reported.

The muscle electric flash signal is used, he explained, for patients of fairly low mental aptitude. Such patients usually are unable to get muscle recoordination clues from either a sense of position or from watching the knee-cap being retracted. (Turn to page 380).

GENETICS

Million-Volt X-ray Used to Change Heredity

X-RAYS at million-volt intensity were used on fruit trees, berry bushes and vegetable seeds in the laboratories of the General Electric Company, to change the physical set-up of the heredity-bearing cells and produce, if possible, new varieties of plants.

The trees and bushes were exposed to the million-volt bombardment for an hour, the seeds for intervals stepped up from 12 to 60 minutes. They have been planted by genetical researchers at the New York State Experiment Station at Geneva. The exposures were conducted by Dr. Bernhard Nebel of Cornell University, assisted by Dr. E. E. Charlton and C. D. Moriarty, of General Electric.

Science News Letter, December 13, 1941



CHANGING CHROMOSOMES

By bombardment with million-volt X-rays, it is hoped the chromosomes of these young apple trees will be altered so that future fruit may have better color, size, flavor and resistance to disease. Dr. Bernhard Nebel, of Cornell University (left) is shown here with Dr. E. E. Charlton and C. D. Moriarty, of the General Electric Laboratories where the experiment is taking place. The box beneath the tube contains seeds.

LANGUAGE

Phonetic Way of Writing Thai Language Helps Foreigners

AN AID to Western nations dealing with Thailand in the Far East is the new official system of spelling and writing the puzzling Thai language phonetically in our occidental A, B, C's.

Remember how Americans tried to say the name of the late King Prajadhipok, when he visited this country? If so, you can imagine diplomatic and commercial language problems encountered in Thailand, the land we used to call Siam. The king's name is correctly pronounced Prachathipok. And it is spelled that way in the new phonetic system.

Transcribing Thai into our type of alphabet is for foreigners and for people in Thailand who have occasion to write in a Western alphabet, explains Murray Sheehan, who directs the Student Department of the Thai Legation in Washington. Thai people themselves, generally speaking, will continue to read and write in their own characters, as usual.

The latest official directory for Bangkok and Thailand looked extremely queer to the Legation staff, including Mr. Sheehan, when they first met names of Thai royalty and officialdom in the new-style spelling.

Opening the big red directory, Mr.

Sheehan pointed out the present ruler's name. It used to be H. M. King Ananda Mahadol. But now the name in English is spelled Anantha Mahidon, which is the way it has been pronounced all along.

Even the new phonetic system does not make Thai a simple language for foreigners, it seems. Thai language has borrowed somewhat from ancient Sanskrit and Pali, and its peculiarities include the hard-and-fast rule that a word can be pronounced only with a few final sounds. However it is spelled, it must be pronounced to end with a vowel or diphthong, or the consonants, m, n, ng, k, t, or p. The present King's name is an example.

But the most difficult feature of the Thai language, says Mr. Sheehan, is the tonal system. Short, one-syllable Thai words do multiple duty by having many meanings, according to the tone of the voice in which they are spoken.

Mr. Sheehan once asked an attaché of the Legation how many words could be made out of the monosyllable "khao." He himself knew that it meant white, rice, and mountain. But the Thai official reeled off 12 words, some so faintly different in tone that a Westerner would not detect the voice change.

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ical artillery, the 200-inch reflector for Mount Palomar, will probably not be completed in 1942, but satisfactory progress is reported on both the great saucer-shaped mirror and its massive mounting.

"The effects of war are beginning to be more and more felt in the field of astronomy," Dr. Bok reports. "Many astronomers in the United States are now working on defense projects and the total output of scientific research is accordingly reduced."

The slowing down of astronomical work has been reflected in the reduced volume of publication of astronomical research reports. In Britain, only about half the normal number of papers on astronomical subjects have appeared, and the German output has been even less, though the quality of work reported holds up. Surprisingly enough, in the conquered and occupied Netherlands, astronomers are apparently fully at work on their research programs again, and even in France interrupted observation schedules are being resumed.

Despite communication difficulties, astronomers manage to keep in touch with each other, and still maintain a considerable degree of the exchange of information that is indispensable for progress in what is probably the most completely international of the sciences.

Science News Letter, December 13, 1941

ASTRONOMY

Doctor Harlow Shapley Receives Pontifical Honor

THE PIUS XI Medal in Astronomy, one of the most distinguished among scientific honors, has been conferred by Pope Pius XII on Dr. Harlow Shapley, director of Harvard College Observatory. The award was announced at a meeting of the Pontifical Academy of Science on Nov. 30. In addition to the medal, there is a grant of 50,000 lire (about \$2,500) in cash.

The award was made to Dr. Shapley in recognition of his distinguished work in developing means for measuring the immense astronomical distances that separate galaxies in the universe, based on the discovery that peculiarities in the behavior of variable stars give a clue to their remoteness in space.

In his address before the Academy, the Pope said: "In the school of God we are all brothers. May all men become brothers again in love and concord, in the victory of good over evil, in justice and in peace."

Dr. Shapley is vice-president of Science Service.

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ASTRONOMY

War Slows, But Does Not Stop Astronomers' Search of Skies

WAR on the earth has not prevented astronomers from moving forward in their conquest of the heavens. A round-up on astronomical progress during 1941 by Dr. Bart J. Bok of Harvard College Observatory shows a formidable battery of five new great telescopes getting into action: two already in use, one finished and being tested, two more due for completion early in 1942.

The two instruments already in action are a 20-inch Ross refractor at Lick Observatory in California and a 24-inch Schmidt telescope at the Warner and Swasey Observatory of the Case School of Applied Science in Cleveland, Ohio.

Twin 24-inch Schmidt telescopes are being constructed, one for Harvard College Observatory, the other for the new Mexican National Observatory at Tonantzintla, Puebla, which will be formally dedicated by President Camacho, late in February. The latter instrument will contribute importantly to astronomical research because of its favorable location at high altitude in low latitude.

The fifth wide-angle telescope under construction is also of the Schmidt type, but with a diameter of 48 inches. It will be mounted at the Hale Observatory on Mount Palomar in California.

The mightiest of all pieces of astronom-

MEDICINE

Cyclotron Treatment of Late Cancer Encouraging

Sixty-One of 129 Patients Who Faced Death Are Saved And Some Perhaps Cured; Ready To Use on Less Hopeless

SIXTY-ONE of 129 patients who faced death from advanced cancer have been saved and some of these perhaps cured by treatments with the great atom-smashing machine—results so encouraging that less advanced cases will now be treated by University of California physicians, it was announced to the Radiological Society of North America meeting in San Francisco.

This announcement, made by Dr. John C. Larkin, research associate in the radiation laboratory, and Dr. R. S. Stone, professor of roentgenology in the University's Medical School, has been awaited by physicians and patients everywhere since treatment of late cancer with the atom-smashing cyclotron was begun three years ago.

A total of 153 patients have been treated during the three years. The 129 with which the report was concerned were treated with the 225-ton cyclotron; the remaining 24 with the 85-ton cyclotron.

Beams of neutrons—sub-atomic particles—are given off by the cyclotron during the atom-smashing process. These neutron beams are shot into the cancerous tissue, producing a marked shrinking of the tumor. The patient feels no sensation, however.

Drs. Larkin and Stone reported that cancer of the skin with extension into the underlying bony structures, cancers of the mouth and throat and primary cancers of the prostate gland have shown the best response to treatment. They said results are "encouraging," and enough is now known about cyclotron treatment to start using it on patients with less advanced cancer.

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Predicts Better Diagnosis

TELEVISION and electron microscope principles will be combined with X-rays to give doctors in the future bigger and brighter views of the interior of the body for diagnosing hidden signs of disease, Dr. W. Edward Chamberlain, of Temple University, predicted.

The electron image of the television camera could be produced with X-rays, instead of with light as at present, he suggested. The electrons could then be accelerated to produce a much brighter image which could be magnified by principles used in the electron microscope. This, finally, would be focused on a fluorescent screen, as the X-ray picture now is. Then the specially trained doctor, by rotating a patient into various positions, would have the equivalent of literally thousands of ordinary X-ray pictures and nothing that now can be shown on these would escape his powers of observation.

Science News Letter, December 13, 1941

Hidden Tumors Located

THE "brain wave" machine may locate hidden tumors in the human brain, enabling surgeons to operate more effectively, Dr. E. R. Witwer, of Detroit, reported.

The electro-encephalograph records on charts tiny waves stimulated by the electric currents of the brain. Unlike healthy brain tissue, tumors seem to generate no current. The tissue around the tumor, however, displays a variety of waves which usually are below 4 cycles per second. These are called Delta waves. They interfere with the normal tracing in the area of a tumor, producing a Delta focus. Presence of such a focus can often guide the surgeon to the tumor, Dr. Witwer explained.

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Fever for Cancer

A NEW treatment for advanced cancer patients which combines artificial fever with X-rays was described to the Radiological Society by Dr. H. S. Shoulders, of Nashville, Tenn. Dr. Shoulders' method calls for the "administration of X-ray therapy while the patient's temperature is elevated, causing an intensification of the destructive effect of X-rays on the cancer cells. . . ."

Dr. Shoulders said he had tried his

method on six advanced cancer patients. Although only one was considered clinically and roentgenologically cured, the other five are living and fairly comfortable—and all were pronounced incurable before the combined treatments were given, he added.

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GENETICS

Drug Speeds Evolution As Does Colchicine

EVOLUTIONARY changes in plants can be promoted by treatment of actively growing tissues with sulfanilamide, which produces effects similar to those brought about by colchicine, Prof. John M. Beal of the University of Chicago told the A.A.A.S. The germ-killing drug stops the process of mitosis or cell division in mid-career, causing the formation of extra large cells with double or quadruple the normal number of chromosomes. This in turn often brings about the origin of strange new plant varieties, some of them giants.

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WHITE SQUIRRELS

This pair of albino squirrels with pink-eyes were photographed on the property of Mrs. Elizabeth Haussler, of Minneapolis, Minn., where they had been born in a maple tree. Mrs. Haussler hand-fed the unusual babies.



TRAFFIC TROUBLE

This is one of the amusing illustrations from the new Spanish textbook (Hastings House) prepared by WPA educators for the use of U. S. Army and Navy air officers and others wishing to learn practical use of the language quickly.

LANGUAGE

Army and Navy Officers Learn Spanish by Verb Approach

Aim of New Method Is To Teach Officers To Think in Spanish; Instruction Oral, Book Only for Reference

By EMILY C. DAVIS

WHAT is it like—this method of teaching Spanish to U. S. Army and Navy air officers that WPA educators have worked out, and our fighting men have approved?

Feeling like a veteran of introductory Spanish courses—having started Spanish four times—I set out to interview the men who wrote the lesson book and the officials who work behind the scenes to keep Spanish lessons running smoothly at 55 air stations throughout the country.

Behind the scenes is nearly literally correct, for the WPA offices in which the Government's Spanish courses are planned and directed is in Washington's old Auditorium, once a theater type of building. Desks and file cases throng the stage, boxes, and dressing rooms. Spanish lessons for officers, it so happens, are evolved in partitioned cubicles somewhere in the mezzanine.

Thousands of our Colonels, Captains, Naval Commanders, and nurses—and recently our non-commissioned officers, too—are being launched into Spanish by

the verb approach, it turns out, and the verb is linked with a noun so that it expresses a thought, right from the start. This method is rather new in America's teaching of languages. A Frenchman named Gouin originated it some years ago, but in the United States it has been used mainly in teaching English to foreigners.

The verb approach is particularly effective with beginners, agree the WPA writers of "Conversational Spanish for the Army Air Forces of the United States," Solomon Lipp and Henry V. Besso. Talking in polite turn-about, and fortunately for the interview in English, they said:

"We feel that a language is learned primarily through the ear. Adults who listen and imitate as a child does are learning the natural way. And it is more natural to learn in sentences.

"We are trying to teach the officers to think in Spanish instead of translating — trying to short-circuit the usual slow mental detours of language study."

To make thinking in Spanish come more naturally, they explain that they chose Spanish words resembling familiar

English wherever there was a choice of synonyms.

To give the aviation officers a talking vocabulary in a short time, the beginners' course uses just 629 ordinary and much used Spanish words, plus 67 technical aviation words. This is reminiscent of the 850 words of Basic English that educators have evolved for simplifying mastery of our own language.

Our Army and Navy fliers are learning to speak Spanish with Latin American pronunciation, rather than Castilian. Every one asks that. This means, chiefly, that in words like hacienda, meaning ranch, the c is pronounced s. In Castilian Spanish as spoken in Europe, it would be pronounced th.

Authors Lipp and Besso turned out their first lesson book in three months, which is something of a record for this type of writing. They did it under tremendous pressure of time, teaching experimental Spanish classes, drafting lesson chapters, taking their copy to advisory committee meetings, revising, improving—and keeping ahead of their students in a close race. Like the goal of teaching French without tears, they seem to have been aiming to give the Army Spanish without swearing, though they did not put it that way. To brighten the chore of home work for officers, the illustrations—which were done by artists in one intense week-end—are amusing cartoons.

The book, Mr. Lipp and Mr. Besso want it understood, is not a reader. It is for reference and study. Teachers in the Government's classes do not have beginners translate and read. The teacher talks—starting right in to talk Spanish verbs and a few words to go with them, and introducing about 12 new words at a lesson.

Since the course is all about adventures of aviators John and Charles who land in a Latin-American country, the teacher helps demonstrate aviation-Spanish terms with a toy airplane, showing with a taking-off swoop how el aeroplano asciende.

The writing team of Lipp and Besso is now working on an advanced course, they say, for officers who wish more advanced Spanish.

The Spanish course is the same at all Army and Navy establishments. They tell about one aviator who has been having fun taking his Spanish lessons in three different places. When it is lesson time he just drops in to school in whatever State he happens to be.

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GENERAL SCIENCE

New Science Service Building Located on N Street Northwest

For 17 Years Guest of National Academy of Sciences
And National Research Council, Now in Own Quarters

See Front Cover

AFTER two decades of activity, Science Service, the institution for the popularization of science, which publishes the *SCIENCE NEWS LETTER*, is occupying a building of its own in Washington.

Upon a quiet street in the heart of our war-busy National Capital, the Science Service staff does its daily work in this four story brick building, located by chance just around the corner from the temporary quarters where in 1921 Science Service had its beginnings.

For 17 years Science Service had been the guest of the National Academy of Sciences and the National Research Council in their monumental building on Constitution Avenue opposite Lincoln Memorial. When that building was erected, because of its close connection with the Academy and the Council, Science Service was invited to make its offices there. With the growth of Science Service and the coming of intensified national defense effort on the part of scientific agencies, that building became crowded, so much so that in recent months the exhibit halls of the building have been converted to offices.

Realizing the impending pressure for space, Science Service in the early spring of this year located and purchased a suitable building at 1719 N St., N.W., which during the summer was remodeled from a large residence into a suitable home for Science Service.

A feature of the new Science Service building is a conference room on the first floor suitable for meetings of from a dozen to fifty or more people. Upon this floor is also located the office of the director, the library and kitchen facilities for occasional use during meetings. The ground floor affords mailing, duplication, addressing and storage rooms, as well as entrance lobby.

The editorial or second floor has individual offices for staff writers and it is here that teletypes hum, bringing in the latest science news from meetings and other localities, and typewriters click out

the copy that appears in reports to newspapers and other Science Service product.

Accounting, subscription and promotion offices are located on the third floor, together with rooms for the use of visiting trustees, etc.

Fluorescent lighting of the latest type has been installed throughout the building. The automatic telephone system used does not require the services of an operator for interoffice and outgoing calls and affords full service out of regular hours.

In its permanent home Science Service expects to continue and increase its service to both the public and the scientific world. The program of Dec. 13 which will be fully reported in subsequent issues of the *SCIENCE NEWS LETTER* is in a very real sense a rededication of the institution to the principles and activities that were set forth and materialized by Scripps, Ritter, Slosson, Kellogg, and others among its trustees and staff.

The photograph on the cover shows the entrance to the Science Service building.

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PSYCHOLOGY—SOCIOLOGY

Major Wars Not Started By Public War Fever

ACHARGE that most students of war have failed to recognize a startling fact—that “decision to wage war precedes by one to five years the outbreak of hostilities”—is leveled by Dr. Theodore Abel of Columbia University.

The prevailing idea that war fever spirals a people into a fight is not correct, Dr. Abel declares in a report on 25 major wars, including the present conflict. (*American Sociological Review*, December)

War fever and milling crowds are part of war's pattern, he states, but they enter the picture after leaders have made the decision to wage war.

Mussolini set a dogmatic dateline for the Ethiopian War of 1935-1936 two years before the war began, Dr. Abel concludes. As evidence, he cites Mar-

shall De Bono's published account of this war, and quotes a conversation reported by De Bono: “It was the autumn of 1933. The Duce had spoken to no one of the coming operation in East Africa; only he and I knew what was going to happen.”

While no authoritative sources are available yet to prove conclusively how the present European War originated, Dr. Abel pronounces “very illuminating” Hermann Rauschnigg's 1939 report of a long talk that he had with Hitler five years earlier. Rauschnigg in this report says that he asked, “Do you seriously intend to fight the West?” and that Hitler retorted, “What else do you think we are arming for?”

Decisions of power groups to start a war are sometimes check-mated by unexpected turns of international events.

“Hitler would not have launched his offensive,” Dr. Abel declares, “if the failure of the League of Nations had not led him to expect that the nations of Europe would act like sheep in a slaughterhouse.”

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PUBLIC HEALTH

Insulin To Be Safe Despite Patent Expiration

CONTINUED high standards for this country's insulin supply, which means the difference between life and death for thousands of diabetic sufferers, will be maintained, if steps reported in the *Journal of the American Medical Association* (Dec. 6) are carried out.

Insulin patent rights, which control the quality of insulin manufactured and sold in the United States and Canada, are now held by the Insulin Committee of the University of Toronto, where the insulin discovery was made. These patents expire on Dec. 24, 1941.

After that date, insulin can be made without license from the University, and consequently uninspected and unsafe insulin might get on the market. A flood of uninspected foreign brands, the *Journal* states, has already reached this country, to be distributed as soon as the patents expire.

To meet the danger of unsafe insulin, the Board of Trustees of the U. S. Pharmacopeia has recommended that the U. S. Government take over the functions of the Insulin Committee when the patents expire. This would insure continuation of the double check on insulin standards—once by the manufacturer, once by the Government.

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MEDICINE

Cure For Athlete's Foot Discovered By Scientist

ACURE for athlete's foot which stops itching immediately and leaves no stain on skin or clothing is announced by Dr. Edward Francis, medical director (retired) of the U. S. Public Health Service. (*Journal, American Medical Association*, Dec. 6.)

Dr. Francis' remedy consist of a mixture of three parts phenol and one part camphor which can be prepared by any pharmacist. He reports that the mixture is "nonirritating and may be painted between the toes several times a day. The sock may be replaced immediately without danger of corrosion."

Users are warned, however, that the preparation should not be applied to wet skin.

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PUBLIC HEALTH

Rats Develop Goiter From New Sulfa Drug

SULFAGUANIDINE, one of the new sulfa drugs which has been used in treating dysentery and similar ailments, causes goiter in rats.

This unexpected discovery is reported by Dr. Julia B. MacKenzie and her husband, Dr. C. G. MacKenzie, and Prof. E. V. McCollum, of the Johns Hopkins School of Hygiene (*Science*, Nov 28).

Whether human patients given sulfaguanidine are in danger of getting goiter from the drug is not yet known. The scientists are now investigating this point.

In rats, the thyroid gland begins to enlarge within a week after being given sulfaguanidine. It grows to from three to 13 times its normal size, depending on the amount of drug given and the length of time it is given.

The discovery is so recent that the scientists have not yet had time to find whether this thyroid enlargement is the kind that occurs in simple goiter due to lack of iodine or in the kind in which the gland is overactive. They expect to find the answer to this soon by feeding the animals extra iodine.

The effect may be due to the sulfa part of the drug or to the guanidine part. This point also is being investigated.

So far, no one seems to have reported any effect of sulfaguanidine on human patients. This may be because rats react differently to the drug or it may be because human patients have not yet been

given enough of it to cause the effect.

The discovery arose from investigation of a possible effect of the drug on the nutrition of the rat. Rats have in their intestinal tract microorganisms believed capable of creating some of the B vitamins and vitamin K. It was thought the drug might cause a deficiency of the vitamin but it did not.

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POPULATION

British Doctor Urges State To Promote Large Families

STATE promotion of large families similar to programs undertaken by Germany and Italy is urged by Dr. A. Spencer Paterson, eminent British physician (*The Lancet*).

"If the family of two children comes to be considered normal," says Dr. Paterson, "the day of England as a world-power is past. Any country whose families average four children, given anything like equal conditions, is likely to oust one like ours, whose birthrate replaces the present population by only 75 per cent."

Dr. Paterson declared that a "heavy responsibility" may be charged against any legislating body "which encourages late marriage such as at present obtains in the medical and nursing professions."

Science News Letter, December 13, 1941

MEDICINE

Try Sulfa Drug, Calcium For Trichinosis Remedy

SULFAGUANIDINE, one of the newer sulfa drugs, will be tried out as a possible trichinosis remedy in laboratory studies by Dr. O. R. McCoy, of the University of Rochester, it was announced by State Senator Thomas C. Desmond, of Newburgh, N. Y.

Trichinosis is a serious disease for which no specific treatment or cure has yet been discovered. It comes from eating undercooked meat of hogs that are infested with the tiny worm, called trichinella. Thorough cooking of pork makes it safe.

Rats also may be infested with trichinellae. Dr. McCoy's test of sulfaguanidine will be made on such animals. Calcium (lime) compounds will also be tested, on guinea pigs, for possible trichinosis-curing ability. The tests are under the auspices of the New York State Trichinosis Commission, of which Senator Desmond is chairman.

Science News Letter, December 13, 1941

IN SCIENCE

GENERAL SCIENCE

NAS Scientific Exhibits Will Be Shown in Dallas

THE scientific exhibits at the National Academy of Sciences in Washington, which were placed there 18 years ago by the General Electric Research Laboratory, have been removed to provide more space for scientists working on defense problems.

However, some of the exhibits will be shown at the meeting of the American Association for the Advancement of Science at their Christmas week meeting in Dallas, Texas, it has been announced by Dr. W. D. Coolidge, General Electric vice president in charge of research.

After that, the exhibits may be shown in museums and schools through the country and eventually return to the Academy after the emergency.

Science News Letter, December 13, 1941

CHEMISTRY

New Plastic Fabric For Upholstery Is Tough

ANEW plastic fabric for upholstery that is said to be stainproof, fireproof, and practically as tough as steel is getting attention at the Modern Plastics Exposition at the U. S. Department of Commerce.

The new material is being tried on New York subways and is being investigated by the U. S. Maritime Commission for upholstering furniture on ships.

That the fabric can be washed with soap and water, does not retain heat like some chair covers, and is tough as steel are among claims made for it by the exhibitors, the Firestone Tire and Rubber Company. Known as Saran, the material is a thermoplastic resin extruded in strands or yarn of various sizes and gauges that can be woven like cloth. It can be produced in practically any weave or color used in producing cotton, silk or other textiles and can be combined with these to make original patterns. Besides upholstery, its uses are expected to extend to table tops, airplane partitions, and room interiors.

Science News Letter, December 13, 1941

NE FIELDS

ARCHAEOLOGY

Prehistoric Jonah— Indian Buried on Whale Bone

PREHISTORIC America now has a Jonah and Whale. The big difference is that our Jonah and his whale were both dead. The story is revealed by the discovery near Santa Barbara of an Indian's remains, buried on a coffin made of a whale's shoulderblade.

Pronounced unique, the whale coffin burial is described by Phil C. Orr of the Santa Barbara Museum of Natural History (*Science*, Dec. 5). To make the coffin, the big shoulderblade slab of the whale was planed flat with stone tools, and decorated by cutting a groove border around the edge so that Olivella shell disks could be set five-to-the-inch in asphalt.

The coffin is less than 47 inches long, and the Indian for whom it was made was a small adult, about 30 to 35 years old. He was buried face down and with his knees drawn up, as if in sleep.

The entire burial, found at an Indian cemetery on Mescalitan Island, has been removed to the Santa Barbara Museum for public exhibition. The Indian is pronounced one of the early Canalino or Chumash Indians.

Science News Letter, December 13, 1941

DENTISTRY

Use Germs vs. Germs Dentists Are Urged

SCIENTISTS are using germs to kill germs, Dr. Morris L. Rakieten, Long Island College bacteriologist, told the Greater New York Dental Meeting.

Introduction of attacking bacteria into the area of severe infections of the head and neck—such as sinusitis—results in a microscopic battle, with the bacteria causing the infection the losers, Dr. Rakieten said. He urged laboratory technicians to develop phages (the attacking bacteria) in pus cultures to simulate conditions they will meet on the actual battlefields of human infection.

Dr. Rakieten said sinus trouble could be treated with phage if the pus is removed first to enable the attacking bacteria to come in close contact with the mucous membranes.

"In cases of dysentery and cholera," he continued, "it appears that the phage actually does destroy the infectious (germs) in the gastro-intestinal tract."

Dr. Rakieten said this new phase of fighting disease has attracted laboratory study all over the world. One worker (Raiga), he said, has treated several hundred cases of all types of severe staphylococcus infections including those of the upper lip, and very large carbuncles. "His percentage of cures is so good that unless one knew the man (as I do) he would be inclined to doubt them."

Dr. Rakieten warned, however, that much more work is necessary before this method of fighting serious infections reaches its most effective stage.

Frequent yawners were warned they may dislocate their jaw bone and possibly end up with arthritis of that joint, in a report by Dr. Louis W. Schultz, of the University of Illinois.

Correction of dislocated jaws has been replaced by the injection of sodium psylliate in more than 183 cases treated by Dr. Schultz and Dr. Walter Shriner.

Science News Letter, December 13, 1941

ENGINEERING

Get Three Dresses For One By Modern Lighting Tricks

GLAMOROUS ladies of tomorrow will buy different-colored light tubes at a dollar or so, instead of new dresses for each evening function.

One girl in a blossom pink gown can change to dusky rose, purplish, or yellowish outfit by clever use of modern lighting, National Electrical Service Executives were informed by O. P. Cleaver, Westinghouse laboratories lighting engineer.

Glamor girls had better watch makeup as the new fluorescent lights gain use in restaurants, offices, and homes. A light makeup is best under these lamps, and a hasty face paint job is likely to look blotchy, Mr. Cleaver warned.

Unpainted skin may look sallow under 3,500-degree white fluorescent lamps, which bring out yellow and green in skin. Other types of white fluorescent light under which a woman may find herself these days are termed Soft White and Daylight, according to Mr. Cleaver's report. He listed colored lights available as blue, green, red, gold, and pink.

Women will have to learn new techniques of makeup, suiting powder and rouge to the new lights if they are to gain charm under fluorescent lighting.

Science News Letter, December 13, 1941

PHYSICS

New Super-Liquid State Just Before Freezing

A NEW super-liquid state, in which the substance is much more fluid than it was originally, was found to occur in certain liquid films one molecule in thickness just before solidifying.

The discovery was made by Drs. William D. Harkins, Lyle E. Copeland and George E. Boyd of the University of Chicago, and was announced by them in a paper presented at the meeting of the American Physical Society in Chicago.

This is of course the opposite of the usual behavior of liquids in solidifying, which generally become more viscous (less liquid) as the freezing point is approached.

The substances which showed this peculiar behavior were three forms of the higher alcohols which have high freezing points. They were particularly chosen because they have long, chain-like molecules like those of lubricating oils.

The investigation is of importance in studying the behavior of lubricants, paints and cleaners, Dr. Harkins stated, and will be continued.

Science News Letter, December 13, 1941

CHEMISTRY

Beer Test For Tin! Shows One Part in Ten Million

ONE PART of tin in ten million parts of beer is enough to make the clear amber fluid perceptibly cloudy, Irwin Stone of the Wallerstein Laboratories in New York, has reported (*Industrial and Engineering Chemistry* Nov. 15).

This, of course, was very annoying to the brewers who package their wares in tin cans. And so, the chemists were asked to investigate.

At once it turned out that none of the usual chemical tests for tin were anything like as sensitive to the metal as the beer itself. So, a search had to be made for a more refined test than any hitherto known. Such a test was finally found and may be applied to water, foods and other beverages than beer.

It should be said that even the amount of tin that would produce a decided turbidity in beer is far below anything that would be harmful to the consumer. It is not his health but the good looks of the beer that is involved.

Science News Letter, December 13, 1941

PHYSICS

Invisible Fences

Attempted Sabotage in Defense Plants Is Being Prevented by "Electric Eyes" Sensitive to Infra-Red

By PAUL KEARNEY

ON a pitch-black, rainy night a few weeks ago, a skulking intruder with a jimmy in his pocket crept silently across the large yard surrounding a war material warehouse. He had managed, undetected by the gateman, to scale the high wall. A watchman on his rounds had just turned the corner of the building and disappeared. There was ample time, it seemed to the skulker, to rush to the truck entrance of the building, pry open a lock and get inside. He took one more step forward, and glanced right and left.

At that moment a tiny white light shone on a panel in the guardhouse and a muffled bell sounded. Guards grabbed their pistols and went into action. The plant is several hundred feet long and has many entrances, but the guards ran unerringly toward the intruder, and nabbed him. Just what he was after isn't clear; he may be a mere thief but he could just as easily be a professional saboteur like those who caused the devastating fires and explosions of the first World War.

Today, thanks to an ingenious device recently perfected, this man and his fellows are running into a new kind of fence, which no one yet has been able to climb or evade. In more than 800 plants, this new barrier, which you can't see or feel, and can't pass undetected, is providing subtle and powerful protection. It is so effective that in 73 attacks in recent months, 54 of the marauders were captured, and the other 19 were scared away, empty-handed, by the almost instantaneous arrival of guards or police.

Walked into Trap

When the man with the jimmy crossed that yard, he walked into the most intricate and foolproof booby trap that modern science has been able to devise. The warehouse yard was honeycombed with invisible infra-red rays several hundred feet in length. No one could approach the building without breaking one of the tell-tale beams, and not even the cleverest saboteur with a full knowledge of the device could tell exactly when a

broken beam would report his presence. Since each beam has its own signal in the control room, watchmen always know where to look for the intruder. And yet the beams are so selective that they ignore the interference of falling leaves or snow, fluttering birds or prowling cats. In many plants like the one described, the intruder does not know when he has betrayed himself, and quick capture is thus facilitated; in some plants, when a beam is severed pandemonium breaks loose automatically in the form of dazzling lights, shrieking siren and clanging gates.

The principle is that of the familiar "electric eye." A beam of light or of infra-red rays is directed at a sensitive bulb, setting up a tiny flow of current which is amplified by vacuum tubes. When the beam is broken, the current ceases to flow, and a mechanism is set in operation which will open or close doors, sound an alarm, or what-not. Until recently, however, these photoelectric devices operated efficiently only over short distances and indoors.

Protection Against Smugglers

Then an army major came to the laboratories of the American District Telegraph Company in New York—a firm specializing in protection against burglary and fire—and posed a problem. The Foreign Trade Zone on Staten Island was soon to be opened. At the piers within this zone, incoming freighters could transfer their cargoes, without going through customs, to other ships bound for foreign ports. To prevent smuggling, it was necessary to surround the zone with sure-fire safeguards. On the land side, a high fence and a force of guards would do the trick, but there remained about 3,000 feet of unprotected shore where vessels had to be prevented from entering without sanction. Solid barriers which would interfere with shipping were out of the question. The officer thought there might be some sort of light ray, sound ray or radio wave which would serve the purpose. The company turned the matter over to Maxwell H. A. Lindsay of its technical staff, a young Newfoundland-born engineer who has

invented several photoelectric burglar alarm devices.

Mr. Lindsay's fence—a bar of light which crosses the water from one end of the zone to the other—was erected early in 1937 and has worked without a hitch ever since. An ordinary beam like the ones which open doors would be useless for the purpose. Its "eye" is not sensitive enough to react to light variations at that distance, and heavy rain, fog or sea gulls would intercept the ray and cause false alarms.

New Type Circuit

So for the long-distance ray device, a new type of circuit for the receiving end was invented, to make the photoelectric eye respond accurately to a distant light. At the other end, two 20-watt prefocused lamps with telescopic lenses are used, mounted one above the other, instead of the single light used before. This makes a thicker, more powerful beam, and birds or other objects likely to pass through it never block it entirely.

Nothing short of complete blocking by a solid object can break this long-range beam and send in an alarm. You can even drape a heavy winter overcoat over the "eye" without breaking the beam for enough light gets through to keep the circuit in operation. But strong sunlight or marine searchlights may fall upon the receiving end of the equipment without disturbing its smooth performance. The "eye" rejects their powerful glare, and obeys only the signal of its light source over half a mile away.

But the most important part of the whole device is a small metal disk which revolves in front of the lamp, chopping up the outgoing light beam into "slices" so thin that the human eye cannot detect them. The photoelectric eye, thousands of feet away, is adjusted to receive a signal of the same vibration as that served up by the revolving disk, or shutter. It ignores all other lights. No flashlight, however powerful, can deceive this new electric eye when there is dirty work afoot and its special beam has been blocked. And if by any chance some supermind of sabotage solved the combination of this intricate light signal, the equipment could be quickly attuned to another vibration.

At Staten Island the ray used is visible by choice, for the beam of light falling

upon the prow of a boat serves as a warning to the captain. In other installations, however, when invisibility is a desirable factor, an ingenious filter takes out the visible light and sends forth infrared beams which no one can see.

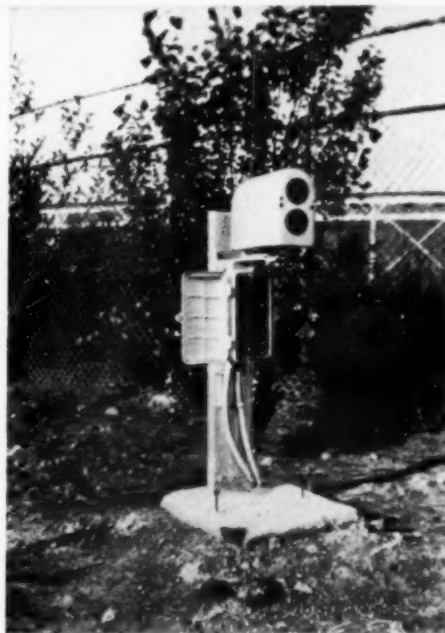
As installed in the grounds surrounding defense plants, the invisible beams add to the confusion of intruders by turning sharp corners. The beam may come through an inconspicuous hole in the factory wall, with the lamp concealed inside. It may travel 500 feet to a mirror concealed in a recess of the outer fence or wall, which reflects it (still invisibly) at an acute angle to the receiving "eye," also concealed, inside another part of the factory wall. Put four or five of these criss-cross beams around a plant, and the intruder hasn't a chance. To keep the mirrors from clouding in damp weather, small electric heaters are mounted behind them. And if a burglar broke one of the mirrors to put the device out of commission, the alarm would be sounded at once.

Prevented Great Losses

The long beams have snared many thieves and prevented great losses in yards where materials are stored. One night in Detroit a few weeks ago, two pilferers trundled a wheelbarrow across the yard of a smelting plant. Before the barrow was half full the police arrived. The thieves had walked through an invisible beam. Similar reports pour in from all sections of the American industrial front. At an Akron plant, the beam caught five burglars in two weeks. In a factory yard at Fort Worth, Texas, the beam served to introduce to the police a man whom they had been longing to meet, and in four months an invisible fence installed by a Baltimore firm nabbed ten intruders and scared away eight others who heard the approaching police cars.

While details have not been released concerning actual military and naval uses of the new beams, it is known that the government has installed them in navy yards, naval bases and army bases—not to take the place of sentries but to supplement them in critical areas. For an airport they constitute ideal barriers which offer no physical interference with planes, and they are considered a godsend to such establishments as oil tank farms with their extensive areas.

The largest invisible fence to date is being installed in one of the nation's biggest aircraft plants. Here an area of several square miles is protected by 28 separate beams. With the equipment



LIGHT TRAP

These two inconspicuous instruments form in combination the invisible fence to trap the invaders of defense plants. At the left is the light source, at the right, the photoelectric receiver.

skilfully concealed, the invisible rays are interlaced in a spider web at varying elevations and angles. A brick wall has a beam running along the top so that no one can scale it undetected. Some of the roofs are crisscrossed with beams to prevent breaking through from above.

Not content to rest on their laurels, electronic engineers are constantly testing the new long beam and planning new uses for it. Last summer an infrared lamp, using the usual pair of 20-watt incandescent bulbs, was set up on a New York roof two miles away from a photoelectric cell, and perfect results were obtained. At present, the long beam is effective under certain conditions for distances up to three miles, and the "eye" can record a signal to which it is attuned from a light four miles away—a light of lower wattage than most reading lamps!

Limit to Beam's Length

At present the practical limit to the length of beam which can be used lies not in the device itself, but in the nature of the terrain to be protected. Because of the size of the average factory and because of elevations in the ground, most beams now used in defense plants run from 300 to 700 feet, but the same beams would be effective over much greater distances. At sea, the length of beam which can be used is limited by the

curvature of the globe. With a beam more than three miles long, sending and receiving devices must be mounted several feet in the air to get the beam "over the hump." A longer beam would allow boats to "crawl under the fence" at each end.

Number of Possible Uses

A number of possible uses are obvious to engineers. With equipment mounted on camouflaged trucks, an invisible ray could be placed across the approach to a military position, and connected with guns so that they would automatically open fire upon an advancing enemy force. Mines at harbor entrances could be discharged in the same manner by enemy craft which break the beam. The present use of short beams to detect smoke in warehouses suggests that beams miles in length might be employed as forest fire detectors in critical areas. A fire warden equipped with supplementary weather reports to enable him to distinguish between fog and smoke alarms would thus be able to watch over many more square miles of forest than he can now observe.

Meanwhile the new fence is not only catching burglars and potential saboteurs every day, but is nabbing them with such split-second speed that they never have a chance to collect the dubious wages of crime.

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MINERALOGY

Bauxite, Vital Strategic Ore Accessible to All Powers

Many Workable Beds in U. S., But We Have Preferred Supplementing Our Supply by Imports from Surinam

BAUXITE, ore of aluminum, more prominent in the national eye than ever since American soldiers moved in on the Dutch Guiana fields, is one of the most impartially distributed of all strategic minerals. None of the warring powers has a monopoly of it. There are large deposits in both North and South America, to meet this country's requirements. Britain has Empire sources in India, Africa and Australia, and her Dutch ally plenty in the Netherlands Indies. There are vast beds of bauxite in the USSR. The Axis powers, on their side, have mines in their own and conquered territories: Hungary, Italy, Yugoslavia and France, with undeveloped deposits also in Greece and Rumania.

Greatest deposits in the United States are in Arkansas, but there are also workable beds in Alabama, Georgia, Mississippi, Tennessee and Virginia. The Aluminum Company of America, until now this country's only producer of aluminum directly from the ore, has not worked the domestic beds to the limit, preferring to supplement the home supply with high-grade bauxite from Surinam (Dutch Guiana) and thereby conserve the ore resources within the boundaries of the United States. In addition to the Surinam bauxite, there are known to be immense deposits in Brazil, but these have not been opened up as yet.

Bauxite is a mineral that looks very much like hardened, fine-grained clay. Essentially it is an oxide of aluminum,

with some water intimately bound in. But combinations of other elements are almost always found with it: iron, silicon and titanium principally, with much smaller quantities of calcium, magnesium, sulfur, manganese and chromium. In its purest form, bauxite is grayish white, slightly tinged with yellow; but presence of the other elements, notably iron, gives it a wide range of shades, from pink or yellow to dark red or brown.

The mineral gets its name from the village of Les Baux, in southern France, near the city of Arles. Here it was first identified and described by a French scientist, P. Berthier, just 120 years ago.

Dictionaries disagree on the pronunciation of the word. Webster's Unabridged and Funk and Wagnalls say it should be pronounced "boze-ite," but the Century Dictionary holds for "bawks-ite," admitting a popular modification to "box-ite." So you can say it as you please.

Interestingly enough, the super-dreadnought of all dictionaries, the massive, ten-volume Oxford, does not list the word at all. The reason apparently is that the first volume, containing all the A-B words, was published in 1888, when aluminum was still only a chemical curiosity and its ore of no particular interest except to a few mineralogists.

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From Page 371

In these patients the lower end of the muscle that bends the knee, located on the under and outer portion of the leg above the knee, is transferred to the paralyzed quadriceps muscle at its lower end on the knee cap. The quadriceps is the muscle on top of the upper leg which extends the lower leg and straightens the knee.

After the operation, the patient must learn how to use the transposed healthy muscle. This knowledge does not come spontaneously or by a trial and error process of learning. The patient "discovers" how to use his transposed muscle after random attempts. Once discovered,

however, the ability to use the muscle is immediately retained by most patients without having to learn it by repetition.

In order to learn how the readjustment of transposed muscles proceeds, why some patients do better than others, and how much can be expected from the operation in a given case, Dr. Phemister has used an apparatus which records the electrical activity produced by the muscle in action, somewhat similar to the electrocardiogram.

Working with him under a grant from the Foundation were Dr. Paul A. Weiss, Dr. C. Howard Hatcher, and Dr. Paul Brown.

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Bronchial Tubes Suspected

THE VIRUS that causes infantile paralysis may be inhaled with the dusty air of summer and fall and invade the body through the bronchial tubes.

This new, though as yet unproved, theory of how the crippling malady spreads and strikes was presented by Dr. Harold K. Faber, of Stanford University.

Monkeys got infantile paralysis by inhaling finely divided, dried droplets of material carrying the virus of the disease, he reported. The infectious particles were fine enough to be inhaled deep into the branches of the windpipe leading to the lungs.

The bronchial membranes are liberally supplied with nerve endings, and there are nerve end organs very near the surface in the air terminals of the lungs, he pointed out. The virus might therefore easily reach the nerves of the spinal cord from the bronchial tubes.

Dr. Faber's results were obtained with monkeys, and so far only with a few of these animals. He emphasized that they are by no means conclusive and that they only suggest a way that humans may get infantile paralysis.

Heretofore scientists have thought that the infantile paralysis virus invaded the body either along the olfactory nerve from the nose or along nerves from the stomach after being swallowed. The olfactory route was definitely excluded and the stomach route probably excluded in Dr. Faber's experiments.

Infantile paralysis occurs oftenest in summer and fall, and at those seasons there is more dust in the air than in the colder and wetter spring and summer. This aspect of the situation has had very little attention in the past and Dr. Faber proposes to investigate it further.

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ENGINEERING

Antiquated Science of 1875 Slows Progress in Defense

THE SCIENCE of mechanisms or of moving machinery, as taught in our engineering schools, is antiquated and useless so far as the production of new machines, particularly of automatic machinery—so much and so quickly needed in our defense effort—is concerned.

This statement was made by Prof. A. E. Richard de Jonge of the Polytechnic Institute of Brooklyn at the meeting of the American Society of Mechanical Engineers in New York.

It all goes back to Reuleaux's "Theoretical Kinematics" published in 1875. Only two of our textbooks have got beyond that date, and that only to the extent of including Gruebler's further developments of 1883-85.

The primary aim was then, and still is in this country, the analysis of already existing mechanisms. But, to be really useful, the science must help in the creation of new mechanisms, of new automatic devices for accomplishing particular purposes, Prof. de Jonge pointed out.

At present, the engineer or machine

designer, called upon to produce the proper mechanism for accomplishing a new task, is obliged to resort to a trial-and-error process, aided only by such knowledge and experience as he has gained since leaving his alma mater. "Yet, to his credit, it may be said that, by his ingenuity, or intuition, he frequently arrives at suitable solutions by such a process," Prof. de Jonge said.

Practical use of the theory of mechanisms requires application of the projective geometry. This subject has been dropped from our college courses. It should be reinstated, Prof. de Jonge declared emphatically. Our whole instruction in kinematics should be reorganized and brought up to date by inclusion of the great advances made in Europe and especially in Germany since 1875. And further research is needed because, even in Germany, the science is still incomplete and has been stagnant for some years past. This should be done quickly and with courage if it is to be in time to be of value in the present emergency, he concluded.

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NUTRITION—ECONOMICS

U. S. Finds New Source of Fish Oil Vitamins in Peru

THE United States can have a new source of needed vitamins from fish oils and Peruvians can improve their diet, if Peru's wealth of fish is made the basis of an expanding fishing industry, it is revealed by a survey made by three U. S. Government experts.

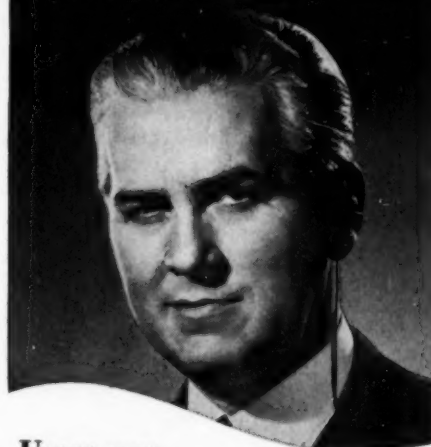
Chartering a purse seiner, the Federal fishery specialists sailed their boat through Peruvian waters, trying experimental fishing with nets, trawls and harpoons, and visiting Peru's fish markets on land. A survey of Venezuela's fishing possibilities is expected to follow, and plans are being studied to survey the whole sweep of Latin American waters from the Caribbean to Cape Horn, with cooperation of countries concerned.

Peru financed virtually all of the expedition's cost, and purchased the exploring fishing boat at the end of the project.

Peru has about 100 varieties of fish used for food, the United States scientists learned, and 60 or more are common in certain markets there. But, while rail facilities for shipping fresh fish inland are adequate from the port of Mollendo and the inland cities would like fish, relatively little sea food is being shipped there and prices in some cases are higher than meat per pound.

As a source of protein, mineral and vitamin ration, fish are pronounced an industry worth expansion in Peru. The United States scientists who made the survey are specialists in fishing problems from varied angles, including marketing, canning, smoking and freezing. They are R. H. Fiedler, Chief of the Fish and Wild Life Service's division of fishery industries, Norman D. Jarvis, technologist, and Milton J. Lobell, biologist.

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Tuna, bonito, and other fish found in the Peruvian waters are pronounced a valuable source of fish liver oils for export trade. Cut off from European sources of vitamin-bearing fish oils, the United States could absorb large quantities of these products for human consumption and for livestock, and there is considered a possibility that the American republics could build up a post-war trade in world markets.

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METALLURGY

"Stainless" Silverware By Plating With Alloy

SILVER plated ware, ordinarily very susceptible to tarnish because of its high purity, can now be made "stainless."

It is done by plating with a tarnish resisting alloy, instead of with pure silver. James Ryder, of Denver, Colorado, who has received patent 2,259,270, invented a special electrolytic bath containing silver fluoride, compounds of tin and of uranium, and non-metallic substances to aid the process, in stated amounts.

The inventor states that his method produces a brilliant plate that requires no polishing or burnishing. He says that he has subjected it to every sort of food and food acid and to all types of sulfur-containing products, egg yoke, rubber, etc., without any trace of tarnish appearing.

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Children of New Skies

Americans are what they are largely because of the American climate. It is enough like the climate of Europe to enable European settlers in the new land to live and work. It is sufficiently different to necessitate changes, sometimes quite radical changes, in ways of living and working.

This is one point developed in *Climate and Man*, the 1941 yearbook issued by the U. S. Department of Agriculture (Reviewed, SNL, this issue.) Following the practice of recent years, the entire book is devoted to a single subject, this time climate, with chapters written by various specialists, and the whole "sym-

posed" under the general editorship of Gove Hambidge.

The first-settled region in what is now the United States was the humid East. Here the climate was most nearly similar to that of Europe. Yet even here they felt the differences sharply. "This was indeed a lustier land to which the settlers had come," writes Dr. Carl O. Sauer, who contributes this section, "a land of hotter summers and colder winters, of brighter and hotter sun and more tempestuous rain, a land suited to and provided with a greater variety of vegetation than the homelands of Europe."

As the descendants of the original settlers, with later-coming immigrants, surged over the eastern mountains and occupied the central valley, then in turn conquered the farther wildernesses of Western plains, desert plateaus and at last the Pacific slope, they met other new climates, most of them with even more violent contrasts than those their forebears had known in the East. The changeable climate of the Plains, for example, is likened by Dr. C. Warren Thornthwaite to a woman—all smiles one moment, a termagant the next. Men have responded to such temperamental weather as they would respond to temperamental wives, neither wholly yielding nor wholly defying, but adapting. And thus they have been molded into a new people—Americans.

The yearbook as a whole is divided into five sections: climate as a world influence, climate and agricultural settlement, climate and the farmer, the scientific approach to weather and climate, and climatic data, with special reference to agriculture in the United States.

Science News Letter, December 13, 1941

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New Machines And Gadgets

Novel Things for Better Living

Every housewife knows how slippery is the dishpan full of soapy water, how hard it is to lift by that narrow rim that runs around the top. All this has been remedied by the simple device of putting a few crimps in the rim at two opposite places into which the four fingers of the hand just fit. For this the inventor was awarded a patent.

Replacing a burnt-out fuse is a ticklish job for the ordinary householder afraid of getting a shock. The difficulty is to ascertain which fuse is burnt out. This is easy and safe with a diminutive neon test lamp made for this very purpose. The two well-insulated leads have hard plastic sleeves near the bare tips which prevent these tips from ever touching each other. The lamp is also provided with a clip—like a pen—so that the professional lineman can hook it over the top edge of his pocket.

A method devised to train persons with poor binocular vision to see in depth is, at the same time, an entirely new method of producing stereoscopic pictures or pictures in depth. Two pictures, one for each eye, are printed on thin transparent polarizing screens, the polarizing direction of one at right angles to that of the other. Viewed superposed, they appear as one badly blurred picture. But when viewed with two appropriately polarizing glasses, one for each eye, the result is a picture in three dimensions.

Shellac is one natural resin for which no synthetic product has yet been found that will replace it in all its uses. However, a product has been developed that will satisfactorily replace it in one of its main uses, namely as a floor finish. The new product may even be superior in its resistance to water and steam.

Small copper tubing can for many purposes be replaced by a flexible semi-transparent plastic which is tough and resists moisture, brines, solvents, acids and alkalis. It can withstand a temperature of 275 degrees Fahrenheit for a short time, and shows far less fatigue to flexing and vibration than does copper tubing.

A spectacle case with a clip, so that it can be held in the pocket like a pen or pencil, has been patented.

Lovers of soda water, here is just what you've been looking for—a contraption that instantly converts any bottle of charged water into a siphon—



keeps in the sparkle, lets out the liquid whenever and in such portions as you may desire. It is made entirely of plastic, even the tube which looks like glass, but isn't. Confidentially, it can also be used for other beverages.

You've heard of the fellow who bent his gun barrel so that he could shoot around a corner. Now we have a portable drill that can drill a hole around a corner. Attachments, fitting any standard portable drill, are provided, that can be turned to any angle with the main drill stem, out at right angles, pointing up or pointing down, or even all the way around so that the drill points directly backwards like the tip of an L. With this arrangement many places can be reached that could not be reached with a straight drill, thus speeding production.

If you want more information on the new things described here, send a three-cent stamp to SCIENCE NEWS LETTER, 1719 N St. N. W., Washington, D. C., and ask for Gadget Bulletin 83.

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SCIENCE CLUBS OF AMERICA

Sponsored by Science Service

NEWS OF CLUBS

AVOCA. N. Y.—The Bunsen Burners has not yet completed its plans for holding a Science Fair this year but this club certainly expects to be able to carry through this idea to a successful completion. The group meets at the Avoca Central School under the sponsorship of the Science Teacher, R. Arthur Gaiser.

PERU. N. Y.—The Alchemists Club of Peru Central High School is planning to hold a Science Fair early next spring. Representatives from schools in the north country will be invited to participate. This year, the club is studying heredity in rats; the effect of colchicine on animals; dyes; and how well rats learn. The entire club recently made a trip to Schenectady where it visited the General Electric House of Magic and Radio Station WGY. The group continued to Albany and examined the interior of a submarine stationed in the harbor. The Alchemists Club is sponsored by Morton Bromley, Head of the Science Department and Director of the Peru Science Center.

● RADIO

Saturday, December 20, 1:30 p.m., EST

On "Adventures in Science," with Watson Davis, director of Science Service, over Columbia Broadcasting System.

Captain John C. Adams, M.C., U.S.N., will discuss aviation medicine in this great national emergency.

Listen in each Saturday.

Monday, December 22, 9:30 p.m., EST

Science Clubs of America programs over WRUL, Boston, on 6.04 and 11.73 megacycles.

One in a series of regular periods over this short wave station to serve science clubs, particularly in high schools, throughout the Americas. Have your science group listen in at this time.

WILLIAMSVILLE, Ill.—The Kem Kam Klub is the name of a group which has been formed at the Williamsville Township High School. Under sponsorship of the Science Teacher, Walter Slater, the group prepares exhibits and laboratory projects. Photographic interests, as the name Kem Kam would convey, have many followers. Of great popular interest are the scientific plays prepared and presented by the club members.

TAMPA, Fla.—Don V. Giunta, sponsor and General Science Instructor, gives lectures and presents demonstrations of interest to the Futurians Science Club of the West Tampa Junior High School. Following demonstrations, or after a field trip, the club members engage in science forums. The members also work on individual projects which are exhibited at local, state and regional conventions. This club is also affiliated with the Florida Junior Academy of Sciences.

CONCORD, N. H.—While the group as a whole joins in science walks, reports and investigations, most of the members of the St. John Science Club at St. John High School work on individual experiments. This is remarkable because the club, sponsored by Sister Mary Eulalia, has a large membership.

BELLWOOD, Pa.—An evening with Dr. Yeagley of the Penn State Observatory will highlight the activities of the Orion Club at the Bellwood-Antis High School. The members then continue to observe the heavens with their own eight-inch telescope. This astronomy club is sponsored by George D. Weiss.

AVISTON, Ill.—The Science Forum, a club formed at the Aviston Community High School, expects to present a Science Fair exhibit early during the spring of 1942. This club finds "Things of Science" generally useful. "Their worth cannot be gauged by the price we pay for them" reports Sister M. Hermias, teacher of Science and mathematics, and sponsor.

NEW BRITAIN, Conn.—The Progressive Chemistry Club of Senior High School, is delving deeply into chemical topics. Papers are written by its members; exhibits, and extensive laboratory work, considerably more advanced than that contained in the school curriculum, is carried on. This group is sponsored by Francis F. Rio, chemistry teacher.

EAST ST. LOUIS, Ill.—Cold weather does not interrupt field trips taken by members of the East Side Science Club of East St. Louis Senior High School. During every month of the year the members always gather plenty of material useful for study by both the club and the biology department of the school. The group is sponsored by J. W. Galbreath, biology teacher.

Clubs are invited to become affiliated with SCA for a nominal \$2 for 20 members or less. You can become an associate of SCA for 25 cents, which includes a copy of the 128-page Science Handbook for 1942. Address: Science Clubs of America, 1719 N St., N.W., Washington, D. C.

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•First Glances at New Books

PHYSIOLOGY

YOUR HEART—Joseph M. Stein—*Alliance Book Corp.*, 240 p., \$2.75. Dr. Stein brings a message of hope for laymen who worry about their hearts. Sensible eating, proper rest, prompt consultation of a physician when early danger signals occur, and avoidance of worry, will save most people the tragedy of "heart trouble". In brief, the book tells in general terms "how to live with your heart." There is a useful chapter on possible occupations for heart patients.

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LANGUAGE

CONVERSATIONAL SPANISH FOR ARMY AIR FORCES OF THE UNITED STATES—Solomon Lipp and Henry V. Besso—*Hastings House*, 168 p., 75c. See page 374.

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ZOOLOGY

A REVISION OF THE STREPSIPTERA WITH SPECIAL REFERENCE TO THE SPECIES OF NORTH AMERICA—Richard M. Bohart—*Univ. of Calif. Press*, 65 p., 75c.

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GENERAL SCIENCE

ANNUAL REPORT OF THE BOARD OF REGENTS OF THE SMITHSONIAN INSTITUTION, 1940—Smithsonian Institution—*Govt. Print. Off.*, 512 p., \$1.50. The appendix contains 24 selected monographs on varied science topics of interest, including "Insects and the spread of plant diseases", "Animal Behavior", "Stonehenge: Today and Yesterday", and "The Future of Flying".

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CHEMISTRY

THE PHOTOCHEMISTRY OF GASES—William Albert Noyes, Jr., and Philip Albert Leighton—*Reinhold*, 475 p., illus., \$10. This monograph is a survey of the available knowledge in the field of photochemistry of gases, presented in a manner intelligible to chemists in other fields and useful to chemists working in the same field. Suggestions for future research are made. Appendices present the data in tabular form and include an extensive bibliography.

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MATHEMATICS

THE CALCULUS OF EXTENSION—Henry George Forder; including examples by Robert William Genese—*Cambridge (Macmillan)*, 490 p., \$6.75. This work is based on Grassmann's *Ausdehnungslehre*. Geometrical theorems are ex-

pressed not in terms of coordinates but in terms of the geometric entities themselves. The method does for geometry what vector analysis does for physics.

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CHEMISTRY

LABORATORY MANUAL FOR INTRODUCTORY COLLEGE CHEMISTRY—Joseph A. Babor and Alexander Lehrman—*Crowell*, 276 p., \$1.75. The experiments in this manual follow the order of subjects in the Introductory College Chemistry by the same authors. More experiments are included than could be used in one course so that a choice can be made to suit the various requirements of different colleges.

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CHEMISTRY

CHEMISTRY KINETICS AND NATURAL PRODUCTS—W. Albert Noyes, Jr., Hugh S. Taylor and Walter A. Jacobs—*Univ. of Penn. Press*, 41 p., 50c. The subjects discussed are: The Photochemistry, Fluorescence, and Spectroscopy of Certain Polyatomic Molecules; The Kinetics of Contact Catalysts; The Chemistry of the Ergot Alkaloids.

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AERONAUTICS

MACHINE TOOLS IN AIRCRAFT PRODUCTION—R. R. Nolan—*Pitman*, 158 p., illus., \$1.50. The young man interested in the mechanical details of airplane construction will find this little book useful in getting acquainted with airplane machine tools, their theory and use.

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CHEMISTRY

DIFFUSION IN AND THROUGH SOLIDS—Richard M. Barrer—*Macmillan*, 464 p., \$6.50. The movement of material particles through a solid is studied in this work theoretically and experimentally and with reference to practical applications. Lists of permeability and diffusion constants are given for ready reference.

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ASTRONOMY

THE MORNING STAR RISES, An Account of Polynesian Astronomy—Maud Worcester Makemson—*Yale Univ. Press*, 301 p., \$5. The poetical myths and cosmical ideas of the Polynesians are given in this book as well as what they knew about astronomy, their method of navigation, by which they made some quite astonishing voyages, and their calendar.

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AERONAUTICS

BOMBER COMMAND—The Air Ministry Account of the Bomber Command's Offensive Against the Axis—*Doubleday, Doran*, 128 p., illus., \$1. An interesting and beautifully illustrated account of what England's airplanes did to the enemy and how they were instrumental in preventing an invasion.

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CLIMATOLOGY—AGRICULTURE

CLIMATE AND MAN, Yearbook of Agriculture, 1941—U. S. Dep't. of Agriculture—*Govt. Print. Off.*, 1248 p., illus., \$1.75. See page 382.

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TECHNOLOGY

RUBBER'S GOODYEAR, The Story of a Man's Perseverance—Adolph C. Regli—*Messner*, 248 p., \$2.50. This is an exciting account of the life of Charles Goodyear and his invention of the vulcanizing process, of his many set-backs, bankruptcies, and even some prison sentences.

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PHYSICS

ELECTRICITY AND MAGNETISM, Theory and Applications (rev. ed.)—Norman E. Gilbert—*Macmillan*, 585 p., \$4.50. This revised edition contains a new chapter on the Theory of Dielectrics, added material on electronics and electron tubes and a new set of problems.

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AERONAUTICS

33 LESSONS IN FLYING—Jay D. Blaufox — *Coward-McCann*, 319 p., illus., \$2.50. Practical hints and short cuts to the potential pilot from a former lieutenant in the Royal Air Force are given in these "Lessons." Written in conversational form, they follow closely the procedure recommended by the Civil Aeronautics Administration and form a supplementary manual to actual flight instruction in an airplane.

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PHYSICS

ELECTRONICS — Jacob Millman and Samuel Seely—*McGraw-Hill*, 721 p., \$5. This comprehensive text is suitable either for courses that lay emphasis on the fundamental theory or for courses where the emphasis is on technical and engineering applications of electronic devices. Radio-frequency amplifiers and other devices connected with radio communications are omitted because these, the authors state, are usually the subject of another course.

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